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GB A 2133938 GB 1540360  
GB A 2129630 GB 1506042  
GB A 2042833 GB 1331825  
GB A 2025711 GB 0732381

(58) Field of search  
H2E

(54) Terminal block with surge arrester

(57) A terminal block of the kind shown in U.K. Patent 2129630B is modified in such that when a surge arrester 5 is removed terminals 1 and 2 are shorted out by a pair of sprung convoluted wire connectors 3 and 3A each contacting earth contact 6. The surge arrester is housed in a waterproof manner. A module containing the surge arrester and connectors is removable from the terminal block.

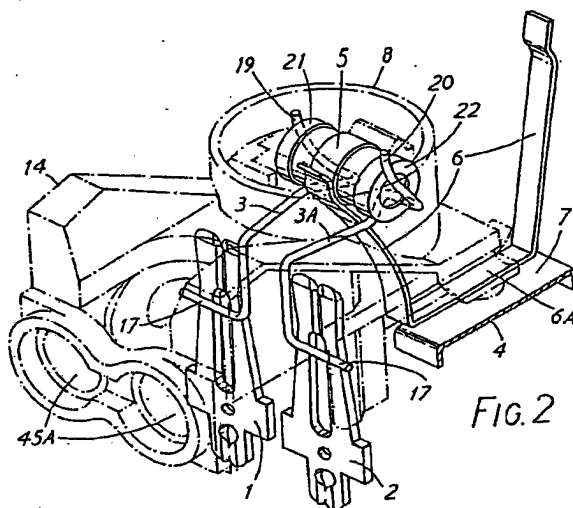


FIG. 2

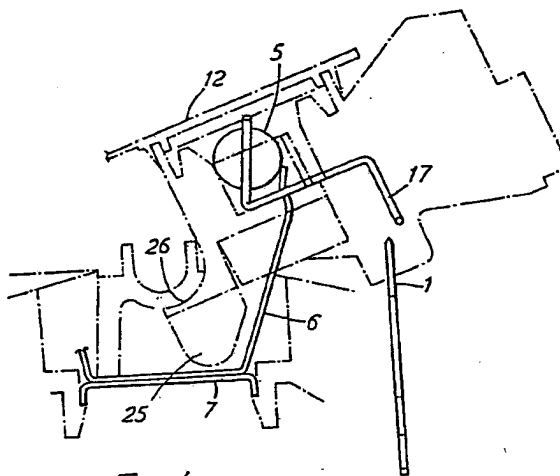


FIG. 4

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

GB 2 176 062 A

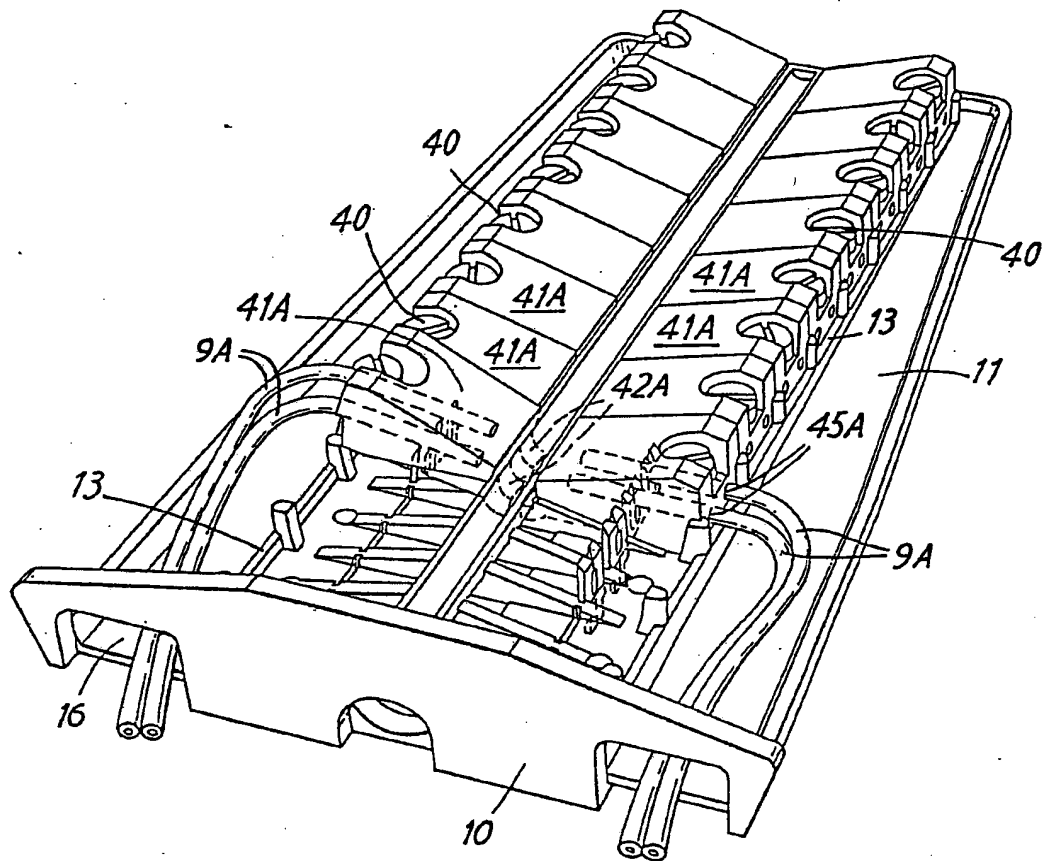
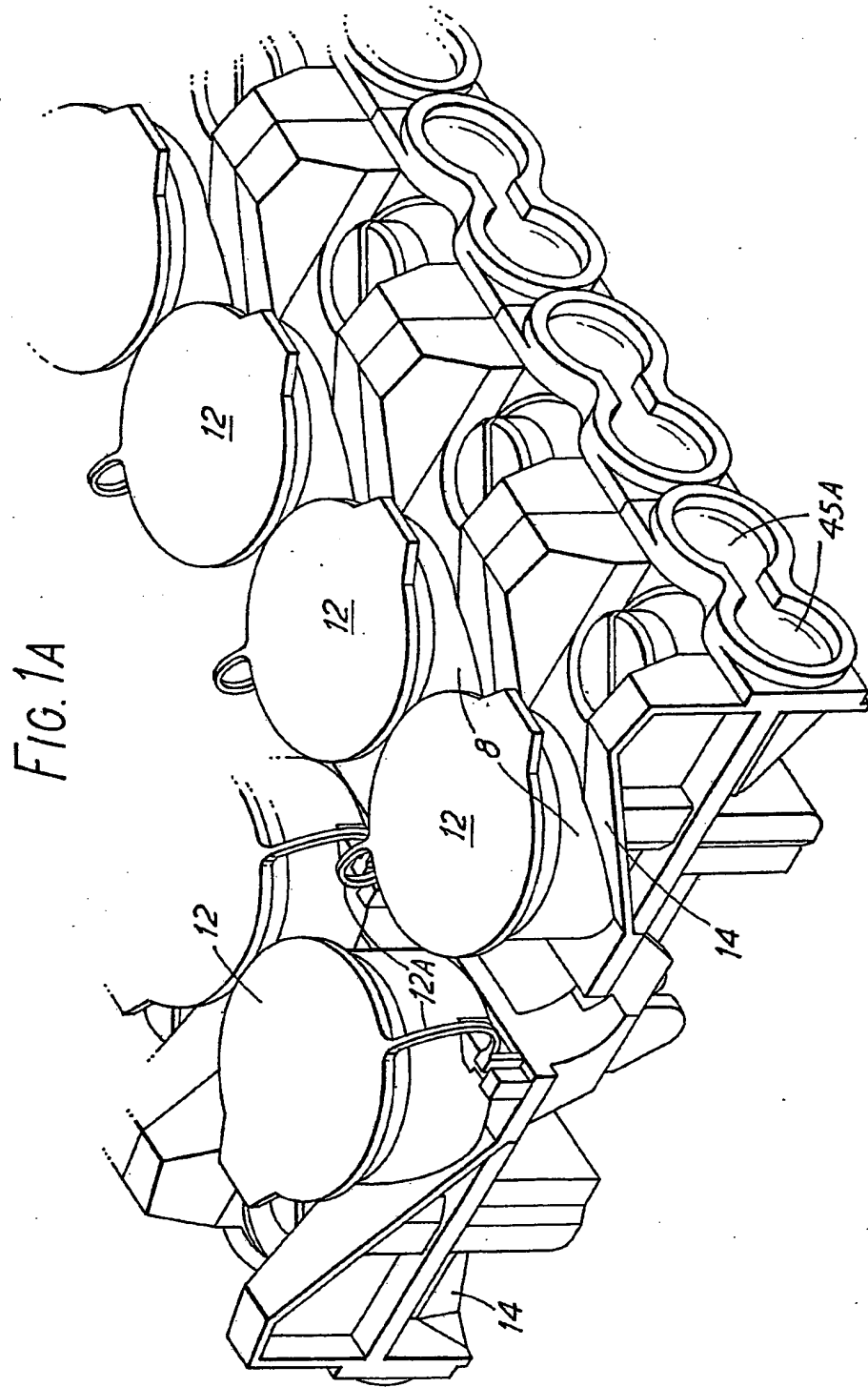
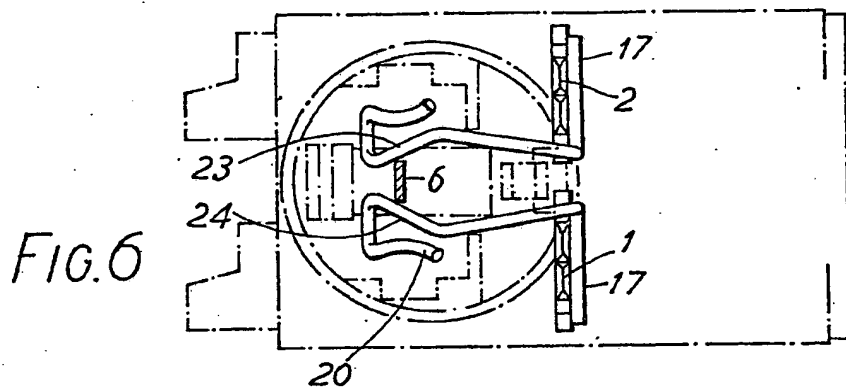
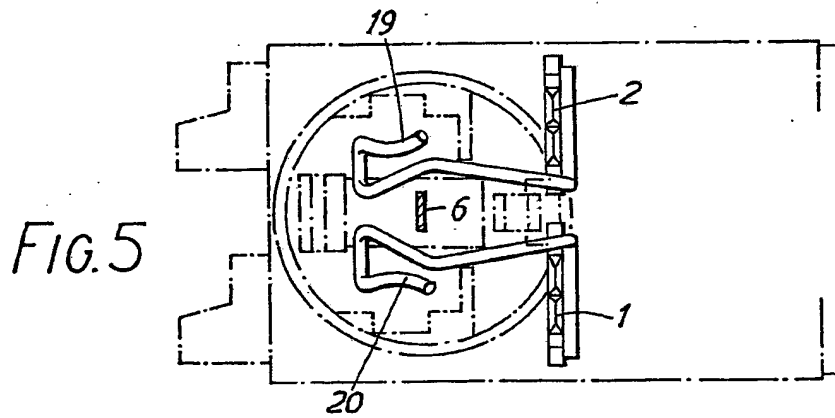
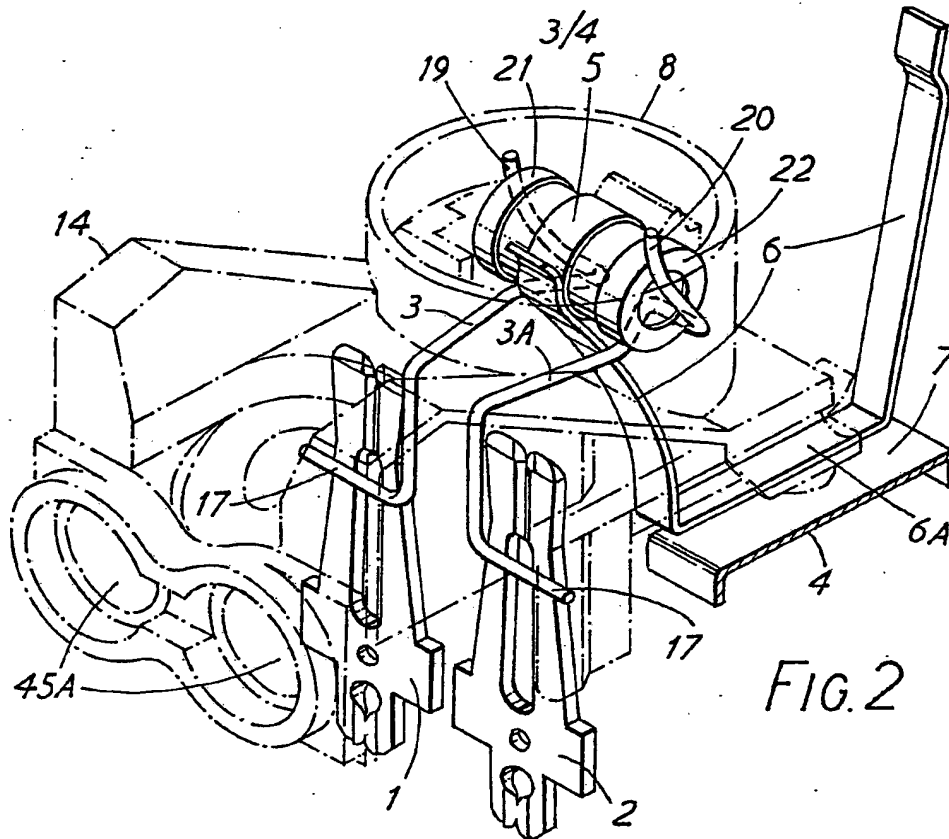


FIG. 1





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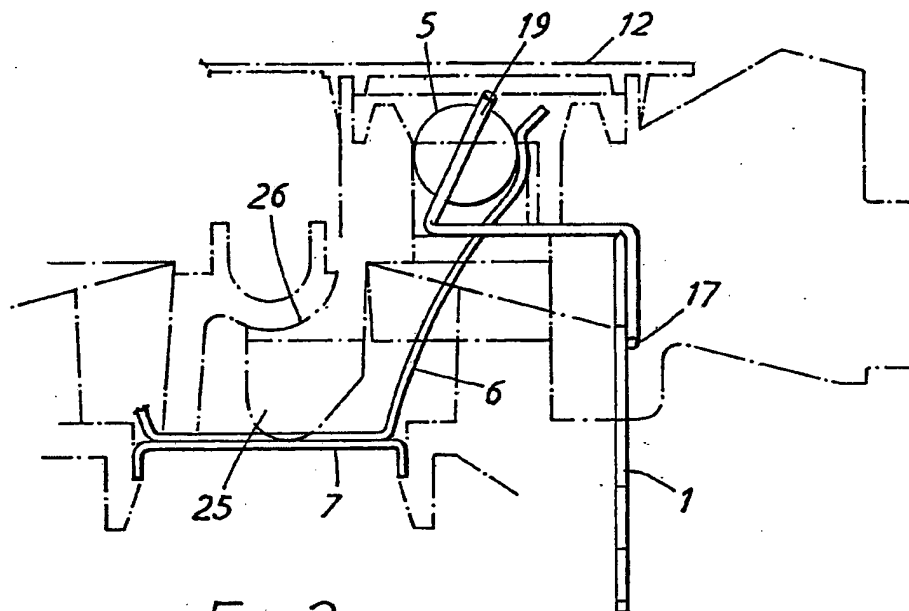


FIG. 3

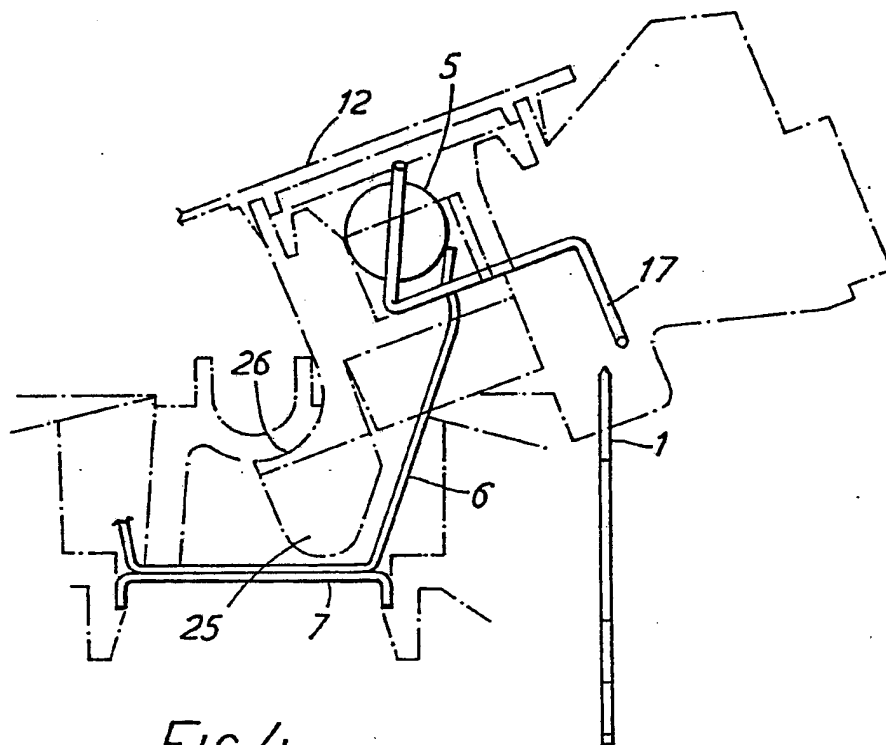


FIG. 4

## SPECIFICATION

## Terminal block

5 This invention relates to a terminal block of the kind described in our Patent Application No.2129630A and is particularly concerned with modification of that terminal block. The terminal block described in that Patent Application is particularly for connecting  
10 side telephone cables to drop wires.

From one aspect the present invention provides, in a terminal block equipped with line terminals and earth terminals and a surge arrestor, means to ensure that when the surge arrestor is removed the  
15 earth terminal will be connected across the line terminals so as to short out the live terminals.

From another aspect the present invention provides, in a terminal block having pivotally mounted members, or rockers, a unique sprung convoluted wire connector which is self-retaining on the rocker and provides resilient connections between the  
20 arrestor and live terminals. The connections also provide connector portions which co-operate with an earth terminal to short out live terminal connections when an arrestor is removed.

From yet another aspect of the present invention a terminal block with pivotally mounted members, or rockers, of the kind shown in Figure 8 of our Patent Application No. 2129630A is modified to receive and  
30 house a surge arrestor in waterproof conditions.

In the accompanying drawings:-

*Figure 1* is an isometric view of a terminal block for connecting exchange side telephone cables to drop wires of the kind described and claimed in our Patent  
35 Application 2129630A, modification of which constitutes the present invention; .

*Figure 1A* shows part of a modified terminal block embodying the present invention;

*Figure 2* is an isometric view of a single modified pivoted element or rocker as used in a terminal block of the type shown in *Figure 1A* and illustrates a modified terminal system, a novel method of retaining a surge arrestor or lightning protector, and a modified housing for the lightning protector, the  
45 rocker being shown in ghosted form in chain dotted line and the contacts, surge arrestor and inter-connecting wire in solid line;

*Figure 3* is a side elevation of the rocker in its working position illustrating the connections between the modified terminals and earth connection and the surge arrestor;

*Figure 4* is a side elevation of the rocker in its raised position;

*Figure 5* is a plan of the rocker in the working position with the surge arrestor removed for clarity and the contacts shown in the positions they adopt when the surge arrestor is present;

*Figure 6* is a plan of the rocker in its working position with the contacts shown in the position they adopt when the surge arrestor is removed.

The type of terminal block shown in *Figure 1* is fully described in our patent application 2129630 and will not be described in detail here. Briefly the terminal block indicated by the reference numeral 10  
65 comprises an insulating body 11 formed of plastics

material and includes a support base (not shown) locatable below the lower surface and a slidable cover (not shown) which covers completely over the whole assembly to protect it from the weather. The base will be secured, for example, to a telegraph pole. On the upper surface of the body 11 there is provided an upstanding wall 13 on each side. Two rows of rockers 41A are pivoted in the block and each rocker 41A has passages 45A for two wires of a  
70 wire pair of a drop wire. The various drop wires which have their wire pairs 9A passing through the indentations 14, 15 enter the housing through openings 16. The wires are then bent inwardly to the respective terminal areas of which there are in fact ten. Thus, ten drop wires can enter on each side so that the terminal block is capable of connecting an exchange side cable to twenty drop wires.

Each rocker 41A has hinge lugs 42A disposed so that they are at the centre of the body 11, adjacent the longitudinal centre line of body 11, rather than near the edge. The advantage of this is that it eases the insertion of the drop wire pairs 9A into the passages 45A which, in this construction, are on the opposite side of the block from the hinge lug so that they are again at the outer side of the block. The insertion of the wire is then slightly downward rather than upward which makes insertion easier.

As shown in *Figure 1* the terminal blocks 41, are pivoted by means of captive bolts 40 in a similar manner to that shown in *Figures 1* to *7* of our patent specification 2129630A.

In accordance with the aspect of the present invention, the terminal system is modified as compared with the one shown in *Figure 1* and described in patent specification 2129630A.

In addition the rockers are modified to receive and house, in waterproof manner, a series of surge arrestors or lightning protectors.

An important feature of the present invention is an arrangement by which, when a surge arrestor is removed the earth terminal automatically moves to a position in which it puts a short circuit across the telephone line terminals so that the telephone line is not usable in the absence of the surge arrestor or lightning protector.

Another feature of the present invention is the method of connecting each surge arrestor to its adjacent telephone terminals by means of a unique design of sprung convoluted wire connector.

In *Figure 1A* a portion of a modified terminal block is shown and it will be seen that the rockers 14 are similar to those in *Figure 1* except for the addition of cylindrical housing 8 on each rocker adapted to house, in waterproof manner, a surge arrestor or lightning conductor. Each housing 8 has a watertight plastic lid 12 held on to the rocker by an integral plastic strap 12A.

One of the modified rockers 14 is also shown in chain dotted line in *Figure 2*. It is designed to receive two telephone terminals, or drop wire contacts 1 and 2, and a resilient earth contact 6. Earth contact 6 is one of a pair joined by a base 6A in contact with an earthing bus bar 7. Terminals 1 and 2 extend upwardly as shown through slots in the rocker 14  
130 and are in line with the respective passages 45A

which receive wires 9A. Earth contact 6 extends upwardly into a cylindrical housing 8 adapted to house and protect, in a waterproof manner, surge arrestor 5. Cylindrical housing 8 is closed by a waterproof sealed lid 12 (Figure 3). Connection between surge arrestor 5 terminals 1 and 2 is effected by a pair of similar sprung convoluted wire connections 3, 3A. These connections automatically occur as each rocker is caused to pivot by means of captive bolt 40. Each wire connector 3, 3A performs a number of functions. Each one has a lower lateral extension 17 which resiliently engages one of the drop wire contacts 1, 2. Each connector 3, 3A also has an upper lateral extension 19, 20 which resiliently engages the outer ends 21, 22 respectively of surge arrestor 5. Together the portions 23, 24 (Figures 5 and 6) of the two connections 3, 3A form a restriction engageable by the earth contact 6, when the protector is not in position, to short out the terminals 1, 2 (see Figure 6).

Finally each connector 3, 3A has resiliently sprung portions which engage the rocker so as to hold the connections in their proper operative positions on the rockers.

It will be appreciated that the rockers are all individually removable from the terminal block and the connectors 1, 2 remain in position on the rocker when it is removed.

Figure 2 shows a rocker fully assembled but with the lid 12 removed to expose the surge arrestor. It will be seen that the earth contact 6 is in contact with the central conductor on the surge arrestor (see Figures 3 and 5). The connectors 3, 3A each make connection between one end of the surge arrestor and one of the terminals 1, 2.

When the rocker is raised by pivoting the rocker about curved lugs 25 which contact cam surfaces 26 as shown in Figure 4, the lateral extensions 17 of the connectors remain in contact with the terminals 1 and 2 and the earth contact 6 slides free of the surge arrestor 5.

When an arrestor 5 is removed the earth contact 6 springs into the position shown in Figure 6 in which the connectors 3, 3A are shorted out by contact between earth contact 6 and portions 23, 24 of the connectors.

This latter feature may be used in other terminal or connection blocks and is not restricted to use in telephone system boxes but may be used for example in electronic computer circuitry etc.

For ease of production each rocker may be produced as two parts which are then clamped together, the split between the parts being in a horizontal plane.

## CLAIMS

1. A terminal block equipped with live terminals and earth terminals and a surge arrestor, and including means to ensure that when the surge arrestor is removed the earth terminal will automatically be connected across the live terminals so as to short out the live terminals.

2. A terminal block according to Claim 1 and having pivotally mounted members, or rockers, and

a sprung convoluted wire connector which is self-retaining on the rocker and provides resilient connections between the arrestor and the live terminals.

3. A terminal block according to Claim 2 and in which the convoluted wire connector also acts as said means to short out the live terminal connections when an arrestor is removed.

4. A terminal block according to Claim 2 or Claim 3 and in which each of the sprung convoluted wire connectors has a lower lateral extension which resiliently engages one of the drop wire contacts, an upper lateral extension which resiliently engages the outer ends of the surge arrestor, and portions which form a restriction engageable by the earth contact when the protector is not in position to short out the live terminals or drop wire contacts.

5. A terminal block according to Claim 4 and in which each connector has a resiliently sprung portion which engages the rocker so as to hold the connections in their proper operative positions on the rockers.

6. A terminal block according to any preceding Claim which is adapted to receive and house the surge arrestor in waterproof conditions.

7. A terminal block according to any preceding Claim in which the rockers are all individually removeable from the terminal block and the connectors or drop wire contacts remain in position on the rocker when it is removed.

8. A terminal block according to any preceding Claim adapted for connecting side telephone cables to drop wires.

9. A terminal block according to any preceding Claim comprising an insulating body, at least one bifurcated solderless connection mounted on the body, a pivotally mounted element carried by the body; the element having at least one passage in it for a wire, and a hole therein extending transverse to the passage or passages, a captive bolt passing through the hole and being engageable within a female thread mounted on the body, whereby when said bolt is screwed into the female thread, the element pivots in a direction such that said wire is urged into the bifurcated solderless connector so that the conductor therein may make electrical contact with the connector, and, when the bolt is unscrewed the pivotal element is made to pivot back to disengage the wire from the connector.

10. A terminal block according to Claim 9 in which the pivotal element is made of insulating material and has extending from one side edge at least one hinge lug for pivotal engagement with the body.

11. A terminal block having pivotally mounted members, or rockers, and a sprung convoluted wire connector which is self-retaining on each of the rockers and provides resilient connections between the arrestor and the live terminals.

12. A terminal block according to Claim 10 having connector portions which co-operate with an earth terminal to short out terminal connections when an arrestor is removed.

13. In a terminal block having pivotally mounted members, or rockers, sprung convoluted wire connector which is self-retaining on the rocker and

provides resilient connections between the arrestor and live terminals, the connections also providing connector portions which co-operate with an earth terminal to short out live terminal connections when  
5 an arrestor is removed.

14. A terminal block substantially as hereinbefore particularly described and as illustrated in the accompanying drawings.

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